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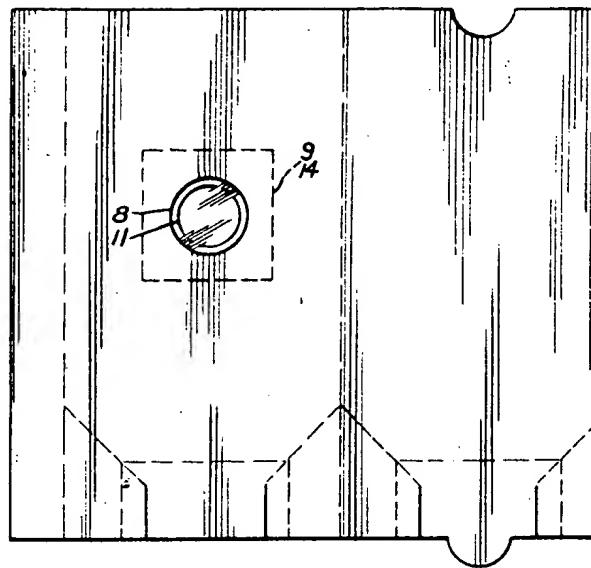
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FIG. 2

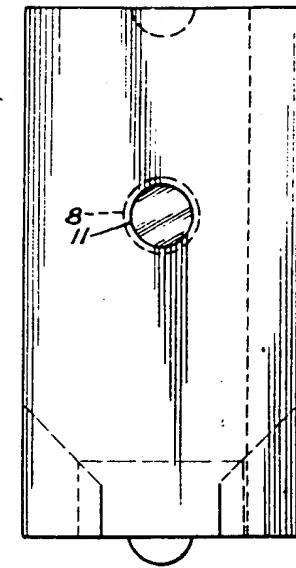


FIG. 3

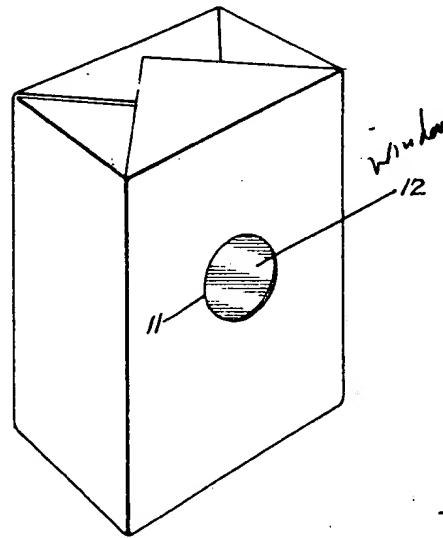


FIG. 1

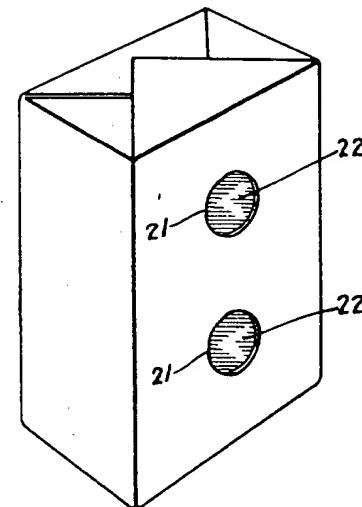


FIG. 9

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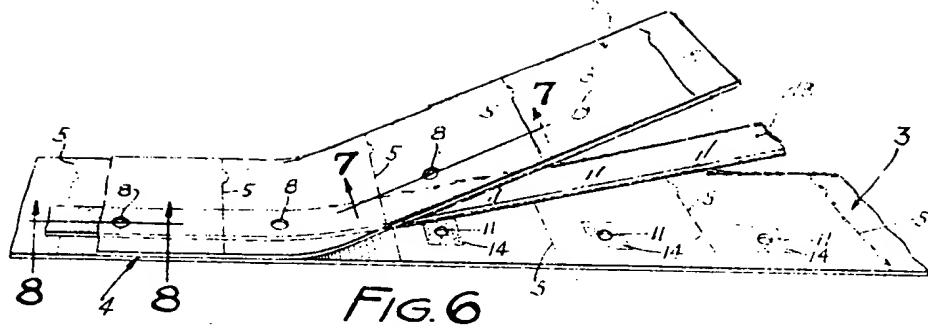


FIG. 6

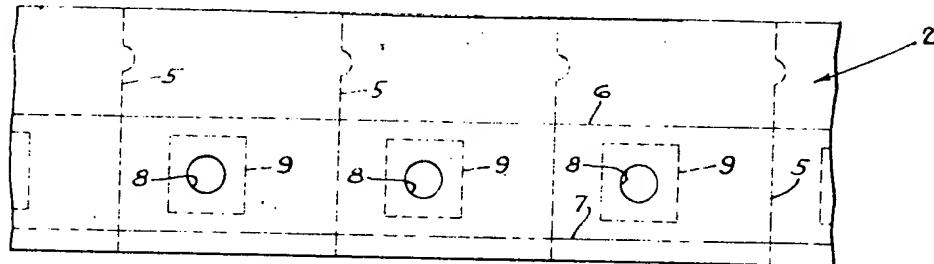


FIG. 5

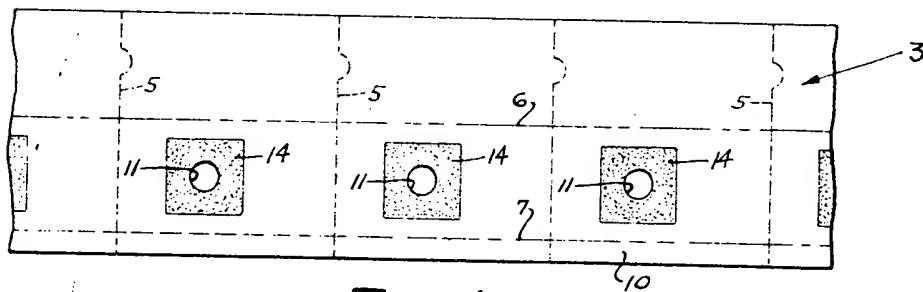
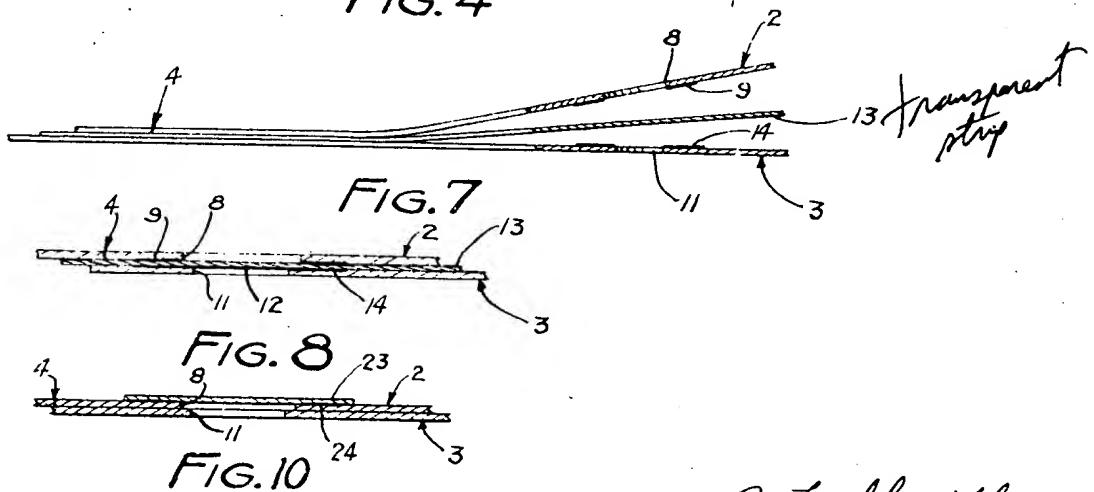


FIG. 4



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PATENT No. 469,025 ISSUED OCT. 31, 1950

Multiple Wall Bag Bodies

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Application November 17, 1947, Serial No. 568,416

3 Claims

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This invention relates to new and useful improvements in the construction of bag bodies and more particularly to multiple wall bag bodies having a window in a wall thereof.

An important object of the present invention is to provide a novel method of forming a window in a wall of a multiple wall bag body whereby the transparent patch or element forming the window is bonded to the plies of the bag wall in a manner to positively prevent leakage or sifting of the contents from the bag body around the window.

A further object is to provide a multiple wall bag body whose walls comprise inner and outer plies, and each of said plies having an aperture therein which are substantially aligned with one another, and a patch of transparent sheet material being interposed between said plies and closing the openings therein, and the marginal wall portions defining said openings being securely bonded to the opposed sides of said transparent window patch, whereby the window patch is secured in place between said plies in leakproof relation.

A further object is to provide an improved method of forming windows in flexible multiple wall bag bodies, which consists in independently forming spaced apertures or openings in the webs or plies which are to be united to form the bag body walls, the openings in said webs being so arranged that when the webs are secured together in flatwise relation, the openings in one ply or web will register with the openings in the other ply, and a strip or patch of transparent window material being interposed between said plies in the operation of securing them together, thereby to close said openings and provide leakproof windows, the composite multiple wall web thus formed subsequently being longitudinally folded upon itself to provide an elongated tubular blank which may then be transversely severed to provide tubular bag body blanks, each having the walls at one end thereof adapted to be folded into bottom-forming relation to complete the formation of the bag body, and whereby each completed bag will have at least one transparent window in a wall thereof.

A further and more specific object is to provide a multiple wall bag body whose walls are composed of a plurality of plies, and the plies constituting one of the bag body walls having openings therein which are substantially aligned with one another, and a transparent flexible window element being interposed between said plies in registry with the complementary openings in said plies, said window element being relatively larger

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than the larger of said openings whereby its marginal edges may be intimately bonded to the marginal wall portions defining the openings in said plies, thereby to prevent leakage or sifting of the material from the bag body through the window provided therein.

A further object is to provide a multiple wall bag body having a window formed in a wall thereof by providing complementary apertures in the plies constituting the bag walls, and inserting a transparent sheet-like window element between the plies in registry with the complementary openings therein, and the areas of said plies surrounding said openings being securely bonded to the opposed surfaces of the transparent window element in such a manner that the outer surface of the bag wall having the window therein will present a relatively smooth surface whereby the wall edges of the window opening in the outer ply is not likely to "catch" on other objects with which the filled bag body may come in contact while being handled or moved about from one place to another.

Other objects of the invention reside in the unique manner in which the transparent window material is interposed between and secured to the plies in the formation of the bag body blank; in the formation of the apertures or openings provided in the inner and outer plies of the bag wall whereby the openings in the inner ply are relatively larger than the openings in the outer ply thereby to allow for relative limited shifting of the two plies in the operation of securing them together to form a composite multiply wall without danger of the edge of the opening in the inner ply projecting into the opening in the outer ply, and whereby the size of the openings in the outer ply will determine the effective size of the windows provided in the walls of the finished bag; and in the provision of a multiple wall bag body having a window in a wall thereof which is so constructed that the bags may be manufactured in quantity production at low cost and with the assurance that the transparent window elements or material interposed between the plies of the bag wall are securely bonded between the inwardly facing surfaces of the contiguous plies of the composite bag walls, whereby leakage or sifting of material from the windows of filled bags is positively eliminated.

Other objects of the invention will appear from the following description and the accompanying drawings and will be pointed out in the annexed claims.

In the accompanying drawings there has been disclosed a structure designed to carry out the various objects of the invention, but it is to be

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understood that the invention is not confined to the exact features shown, as various changes may be made within the scope of the claims which follow.

In the drawings:

Figure 1 is a perspective view showing a filled bag having a window in a wall thereof;

Figure 2 shows a flat bag body blank of dual ply material having a window formed in a wall portion thereof;

Figure 3 is a view showing a tubular bag body blank with a window in a wall thereof;

Figure 4 is a view showing the outer ply of a multiple bag body wall transversely scored to provide flat bag body blanks each having an opening therein, and the wall area around each opening being coated with a suitable adhesive;

Figure 5 is a view showing the inner wall ply having spaced openings therein of relatively larger diameter than the openings in the outer wall ply and spaced to register with the spaced openings in the outer ply;

Figure 6 is a perspective view showing a strip of transparent window material being interposed between the inner and outer wall plies as the two plies are pressed into flatwise engagement with one another in the operation of forming the composite dual ply blank, a suitable adhesive previously having been applied to the inner surfaces of the plies to bond the window strip in position therebetween, when the two plies are pressed into flatwise relation and secured together;

Figure 7 is a longitudinal sectional view on the line 7—7 of Figure 6;

Figure 8 is a detail sectional view on the line 8—8 of Figure 6;

Figure 9 is a view similar to Figure 1, but showing a bag body having vertically spaced windows in a wall thereof; and

Figure 10 is a view similar to Figure 8 showing the transparent window element adhered to the inner surface of the inner ply.

The novel bag body herein disclosed is shown formed from two separate webs 2 and 3 of a suitable bag forming material such as paper. The two webs or plies are placed one upon the other and suitably bonded together to provide a composite multiple wall web 4, as shown at the lefthand end of Figure 6. To simplify the description, the web 2 will hereinafter be referred to as the inner ply and the web 3 as the outer ply. When the plies 2 and 3 are secured together in flatwise relation, as shown at the lefthand end of Figure 6, they co-operate to provide a composite multiple wall web which may subsequently be severed into individual bag body forming blanks, as is well known in the art.

Each web is preferably longitudinally scored as indicated at 6 and 7 in Figures 4 and 5, to facilitate folding the composite web 4 longitudinally to form tubular bag body blanks. Before bonding the plies 2 and 3 together, a plurality of longitudinally spaced apertures 8 are formed in the inner ply 2. The wall area surrounding each aperture 8 of the inner ply 2 is shown coated with a suitable adhesive, as indicated at 9. There are now available transparent adhesives which readily lend themselves for use in the manufacture of bag bodies of the type herein shown, although it is to be understood that non-transparent adhesives may be utilized without departing from the scope of the invention.

Similar longitudinally spaced openings 11 are provided in the outer ply 3. The openings 11 are relatively smaller in diameter than the openings 8

in the inner ply 2, whereby when the two plies are bonded together, as shown in Figure 8, the complementary apertures 8 and 11 in the two plies will appear substantially aligned with one another, even though the plies may, in the operation of securing them together in flatwise relation, slightly shift relative to one another.

By making the apertures or openings in the inner web or ply 2 larger than the openings 11 in the outer ply, whereby the edge walls of the openings 8 in the inner ply cannot extend into the openings 11 of the outer ply, the shape of the openings in the outer ply wall always determines the shape or contour of the completed windows in bag body walls, as will be understood. A suitable adhesive 14 is also preferably applied around the apertures 11 of the outer web or ply 3, as best shown in Figure 4.

After the webs 2 and 3 have been bonded together to provide the composite web shown at the left in Figure 4, said web may be longitudinally folded upon itself along the fold line 6, after which the web 2 is similarly longitudinally folded along the fold line 7 to provide a marginal bonding flange 10 adapted to be folded into bonding engagement with the opposite marginal edge of the composite web, thereby to form an elongated tubular blank which is subsequently transversely severed, as indicated at 5 in Figures 4, 5 and 6, thereby to provide bag forming blanks as shown in Figure 3.

An important feature of the invention resides in the formation of the window 12, shown in the finished bags illustrated in Figures 1 and 9. The transparent window forming material may be applied in the form of a strip 13, as shown in Figure 6, which may be continuously fed between the plies 2 and 3, in the operation of bonding the webs together as indicated in Figure 7. When the window forming material is thus interposed between the two plies 2 and 3, it may be fed from a suitable supply roll in a manner similar to the webs or plies 2 and 3, as is well known.

If desired, the window forming material may be cut into small patches or pieces, one such piece being interposed between the two plies by suitable means, not shown, at each pair of complementary window openings in said plies, after which the two plies may be firmly bonded together in the areas adjacent to the window patches, as indicated in Figures 4 and 5. The bag wall plies at the ends of the bag body blanks may be secured together by ply or spot pasting in the usual well known manner. In some instances, it may be found more desirable to utilize a window material which is so constructed that its opposed surfaces may be bonded to the bag wall plies by the application of heat thereto, in which case the transparent window forming elements or strip 13 may be secured in position between the plies 2 and 3 to close the openings 8 and 11 therein by the application thereof of heat and pressure. When such a window-forming material is employed, the operation of applying an adhesive to the inner surfaces of the plies of the bag wall, as shown at 9 and 14 in Figures 5 and 4, respectively, may be dispensed with.

In Figure 9 we have shown a bag body having two window openings 21 therein, disposed one over the other, and closed by a suitable window material 22, similar to that shown in the previous figures. Obviously, any desired number of windows may be provided in one or more of the bag body walls, and the contour of the window openings may also be varied, if desired, without departing from the scope of the invention. In some instances, it may also be found feasible to provide windows

in the walls of single-ply Kraft paper bags. In bags the window patch is applied to the inner surface of the bag wall over the window opening therein and is suitably secured to the marginal edge wall portions which define the window openings in the bag walls.

In Figure 10 we have shown a dual ply bag body wherein aligned window openings 8 and 11 are shown provided in the inner and outer wall plies 2 and 3, respectively, as in Figure 8, but instead of the transparent window element, indicated by the numeral 23, being secured in position between the wall plies, it is shown secured directly to the inner surface of the inner wall ply by a suitable adhesive 24. When such a construction is used, the wall plies 2 and 3 may be spot-pasted or bonded together around the window openings therein to prevent separation of the plies at these points. Such spot-pasting is well known in the art, and further explanation is, therefore, believed unnecessary. In the form shown in Figure 10, the transparent window element 23 may directly contact the marginal wall portion defining the window opening 11 in the outer ply 3, as will be understood by reference to Figure 10, it being understood that the thicknesses of the wall plies are considerably exaggerated in Figures 8 and 10.

It will be apparent to those skilled in the art that we have accomplished at least the principal objects of our invention, and it will also be apparent to those skilled in the art that the embodiments herein described may be variously changed and modified without departing from the spirit of the invention, and that the invention is capable of uses and has advantages not herein specifically described; hence it will be appreciated that the herein disclosed embodiments are illustrative only, and that our invention is not limited thereto.

We claim as our invention:

1. In a multiple wall bag body having a window in one of its walls and the walls of said bag each comprising an inner and an outer ply, said window being formed by providing complementary openings in said plies which are substantially axially aligned in the formation of the bag wall, the opening in the outer ply being relatively smaller than the opening in the inner ply whereby the marginal wall portion defining the opening in the outer ply will overhang the corresponding marginal wall portion of the inner ply, and a transparent sheet-like window element being adhered to the inner surface of the inner ply in position to completely close the complementary openings in said wall plies, and the marginal overhanging wall portion of the outer ply being adhered to said transparent window element to prevent the entrance of foreign matter between the wall plies at said window.

2. A bag composed of a flexible dual-ply wall bag body comprising an inner ply of flexible opaque paper having a window opening formed in at least one of the walls of said inner ply, an outer ply of flexible opaque paper disposed over and covering one face of said inner ply, said outer ply having a window opening formed in a wall thereof corre-

sponding with the window opening formed in the wall of said inner ply and in axial alignment therewith, said inner ply window opening having the same shape as the outer ply window opening and being larger than said last named opening, a narrow continuous strip of each of the opposed surfaces of said inner and outer plies adjacent the edges of the axially aligned window openings formed in each of said plies having an adhesive coating, and an intermediate flexible transparent cellophane sheet positioned between said inner and outer plies and extending across the axially aligned openings formed therein, said inner and outer plies each being bonded to the adjacent contacting face of said flexible cellophane sheet adjacent the marginal edges of each of the axially aligned window openings provided in said inner and outer plies, the contacting faces of said inner and outer plies in the remaining area being free to move relatively, whereby said bag may be flexed without causing deterioration of said flexible cellophane sheet.

3. A bag composed of a flexible dual-ply wall bag body comprising an inner ply of flexible opaque paper having a window opening formed in at least one of the walls of said inner ply, an outer ply of flexible opaque paper disposed over and covering one face of said inner ply, said outer ply having a window opening formed in a wall thereof corresponding with the window opening formed in the wall of said inner ply and in axial alignment therewith, said inner ply window opening having the same shape as the outer ply window opening and being larger than said last named opening, a narrow continuous strip of each of the opposed surfaces of said inner and outer plies adjacent the edges of the axially aligned window openings formed in each of said plies having an adhesive coating, and an intermediate flexible transparent cellophane strip positioned between said inner and outer plies, said flexible transparent strip extending from the top to bottom edges of said inner and outer plies and across the axially aligned window openings formed therein to space said plies, said inner and outer plies each being bonded to the adjacent contacting face of said flexible cellophane strip adjacent the marginal edges only of each of the axially aligned window openings provided in said inner and outer plies, the contacting faces of said inner and outer plies and the interposed flexible cellophane strip in the remaining area being free to move relatively, whereby said bag may be flexed without causing deterioration of the portion of said flexible cellophane strip disposed across said window openings.

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